

MINERAL INDUSTRY SURVEYS

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NICKEL IN AUGUST 1996

Reported domestic nickel consumption in August 1996 was 5% greater than that of July, according to the U.S. Geological Survey. Daily usage by the stainless steel industry was up almost 8% from the revised July figure of 96.4 metric tons (t). Increased consumption of elemental nickel by the superalloys and brass industries was offset by reduced demand from other parts of the nonferrous sector. Sales to plating companies averaged 38 t per day, slightly less than in July. Percentages reported in this paragraph may not be verifiable due to the concealment of company proprietary data. Trade data for August will appear in a subsequent issue.

Electric vehicles begin to roll off assembly lines in Western Europe and the United States

Increasing numbers of electric vehicles (EV's) are beginning to emerge from assembly plants in both Western Europe and the United States. Japanese automobile manufacturers are expected to follow suit within 6 months. Automobile manufacturers, metal producers, electric utility managers, environmentalists, and regulatory officials are all watching to see how these first mass-produced EV's will be received by the general public. Five different battery chemistries are being used: nickel-cadmium (Ni-Cd), valve-regulated lead-acid (VRLA), lithium-ion (Li-ion), nickel-metal hydride (Ni-MH), and zinc-air. The outcome could significantly increase nickel demand and possibly even change nickel production technology if one of the two nickel batteries wins out in the competition.

On December 5, General Motors Corp. (GM) began leasing its EV1 at 26 Saturn dealerships in Arizona and southern California.¹ The EV1, a fully equipped sports coupe, is intended for short distance commuting. It has a range of about 90 miles (145 km) on the open highway, but only 70 miles (113 km) in city traffic. The vehicle weighs 1,347 kilograms (kg) and has a 137-horsepower three-phase AC induction motor powered by a 16.8 kilowatt-hour maintenance-free lead-acid battery pack. The battery pack weighs 533 kg and constitutes almost 40% of

the vehicle's total weight. The EV1 is being made at GM's Lansing Craft Centre in Michigan.

The EV1 is available to retail customers through a \$0-down, 36-month/30,000-mile lease program. Monthly payments are expected to range from \$480 to \$640. The automobile has a capitalized lease cost of \$33,395, but Federal, State, and local tax credits could reduce the actual cost to consumers in southern California to \$25,595.

Next spring, Honda Motor Co. Ltd. will begin leasing its four-passenger compact EV to fleet owners in the Los Angeles and Sacramento areas of California. The Honda is made in Japan and has a rated range of 100 to 125 miles (161 to 201 km) per charge in the city. The 288-volt brushless DC motor is powered by 24 12-volt sealed Ni-MH batteries.

Also next spring, Nissan Motor Co. Ltd. will begin a limited leasing and sales program in Japan for its Prairie Joy EV. The Prairie Joy will carry four people and is intended initially for local government and fleet users. The 1,690-kg EV will be powered by Li-ion batteries developed jointly by Nissan and the Sony Corp. Li-ion batteries have about 1.5 times the energy density (i.e., storage capacity) of equivalent Ni-MH batteries.

In France, PSA Peugeot Citroën and Renault are both producing about 5,000 Ni-Cd powered EV's per year. For more than 6 years, Peugeot Citroën has been field testing some 50 EV's at the port of La Rochelle. In October 1996, British sponsors bought 14 Peugeot 106 Electriques and will field test them in the Midlands city of Coventry for at least a year.² The Ni-Cd batteries are made by SAFT, SA of France. SAFT's new plant at Bordeaux is now capable of producing Ni-Cd batteries for about 15,000 vehicles per year.

¹Akre, B. S. GM Opens Electric Era. Washington Times, Nov. 15, 1996, p. B-8.

²Simonian, H. Electric Cars Experiment Gets the Green Light. Financial Times (London), Oct. 15, 1996, p. 10.

TABLE 1
CONSUMPTION OF NICKEL (EXCLUSIVE OF SCRAP), BY FORM AND USE 1/

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total	Total year to date
1995:					
August	7,100	1,720	225	9,040	69,500
September	7,720	2,460	309	10,500	80,000
October	6,590	1,840	337	8,770	88,700
November	5,830	1,690	630	8,150	96,900
December	6,250	1,860	244	8,360	105,000
January-December	82,900	17,400	4,950	105,000	XX
1996:					
January	6,930	1,500	309 r/	8,740	8,740
February	7,010 r/	1,230	268	8,510 r/	17,200
March	6,760 r/	1,480	318	8,560 r/	25,800 r/
April	6,620 r/	1,490	249	8,360 r/	34,200 r/
May	7,060 r/	1,470	285	8,820 r/	43,000 r/
June	6,690 r/	1,530	236	8,450 r/	51,400 r/
July	6,490 r/	1,160	130 r/	7,780 r/	59,200
August:					
Steel:					
Stainless and heat resisting	1,880	1,340	W	3,220	25,100
Alloy (excludes stainless)	356	W	W	356	4,840
Superalloys	951	--	W	951	8,700
Copper-nickel alloys	W	W	--	W	W
Electrical, magnetic, and expansion alloys	W	--	--	W	W
Other nickel & nickel alloys	1,240	--	W	1,240	12,000
Cast iron	W	--	W	W	W
Electroplating (sales to platers)	1,180	--	W	1,180	9,620
Chemical and chemical uses	W	--	W	W	W
Other uses	631	117	140	888	6,710
Total reported	6,240 2/	1,450	140	7,830	67,000
Total all companies (calc) 3/	XX	XX	XX	11,400	97,600
1996: January-August	53,800	11,300	1,930	67,000	XX
1995: January-August	56,500	9,530	3,430	69,400	XX

r/ Revised. W Withheld to avoid disclosing company proprietary data; included in "Other uses" category.

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Of consumption, 5,150 metric tons were consumed as cathodes and pellets, the remainder as briquets and powder.

3/ Figures represent calculated apparent consumption; based on the revised proportion of reported primary consumption (68.69%) to apparent primary consumption for 1994.

TABLE 2
ENDING STOCKS OF NICKEL (EXCLUSIVE OF SCRAP) HELD BY CONSUMERS,
BY FORM AND USE 1/ 2/

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total
1995:				
August	5,000	372	161	5,530
September	4,300	324	123	4,750
October	4,900	429	115	5,450
November	5,630	362	115	6,110
December	5,190	635	204	6,030
1996:				
January	4,690	329	106	5,120
February	5,060 r/	292	95	5,450 r/
March	4,610 r/	207	69	4,890 r/
April	4,430 r/	131	81	4,640 r/
May	4,060 r/	342	92	4,500 r/
June	3,640 r/	337	91	4,070 r/
July	3,450 r/	516	70 r/	4,040
August:				
Steel (stainless, heat resisting and alloy)	1,340	426	(3/)	1,760
Nonferrous alloys 4/	1,750	--	(3/)	1,750
Foundry (cast irons)	(3/)	--	(3/)	(3/)
Chemical (catalysts, ceramics, plating salts, etc.) and unspecified uses	157	--	70	227
Total	3,250	426	70	3,740

r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Stocks held by companies that consume nickel in more than one end use category are credited to the major category. Stocks are subject to revision owing to inventory adjustment.

3/ Included in "Chemicals and unspecified uses" category.

4/ Includes super, nickel-copper and copper-nickel, permanent magnet, and other nickel alloys.

TABLE 3
CONSUMPTION AND ENDING STOCKS OF PURCHASED SECONDARY NICKEL, BY USE 1/

(Metric tons, nickel content)

Period	Consumption			Stocks		
	Ferrous scrap 2/	Nonferrous scrap 3/	Total scrap	Ferrous scrap 2/	Nonferrous scrap 3/	Total scrap
1995:						
August	3,190	858	4,050	3,400	109	3,500
September	4,140	729	4,870	3,200	96	3,300
October	3,030	650	3,680	3,490	103	3,600
November	4,300	901	5,200	3,240	109	3,350
December	3,970	644	4,620	3,500	103	3,600
January-December	48,900	9,200	58,100	XX	XX	XX
1996:						
January	3,430	760 r/	4,190 r/	3,710	121	3,830
February	3,380	1,120 r/	4,500 r/	4,190	114	4,310
March	4,680	965 r/	5,650 r/	3,970	94 r/	4,060
April	3,900	810 r/	4,710 r/	3,750	90	3,840
May	4,110	781 r/	4,890 r/	3,130	100	3,230
June	2,540	621 r/	3,160 r/	3,380	100	3,480
July	2,760	683 r/	3,440 r/	3,720	97	3,820
August	2,010	555	2,560	3,780	91	3,870
January-August	26,800	6,290	33,100	XX	XX	XX

r/ Revised. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Nickel content is calculated from an average nickel content and the reported gross weight of scrap.

3/ Combined consumption and stocks of aluminum-base, copper-base, and nickel-base scrap.

TABLE 4
U.S. IMPORTS FOR CONSUMPTION OF NICKEL, BY COUNTRY 1/

(Metric tons, nickel content 2/)

Period and country of origin	Cathodes, pellets, and briquets	Powder and flakes	Ferro- nickel	Metal- lurgical- grade oxide	Waste and scrap	Stainless steel scrap	Chemicals	Total 3/	Total year to date 4/	Wrought nickel
1995:										
July	6,400	273	1,570	51	270	269	348	9,180	92,500	118
August	10,400	628	1,500	23	303	290	328	13,500	106,000	44
September	9,060	767	1,880	71	332	271	518	12,900	119,000	33
October	11,200	859	1,470	32	342	211	302	14,400	133,000	33
November	9,200	820	1,440	35	387	261	346	12,500	146,000	34
December	8,930	563	830	25	308	239	210	11,100	157,000	77
January-December	118,000	9,510	16,700	530	4,740	3,190	4,210	157,000	XX	2,310
1996:										
January	11,000	1,030	887	46	333	313	377	14,000	14,000	51
February	9,970	709	1,540	14	309	312	419	13,300	27,200	55
March	9,130	917	2,130	39	385	369	241	13,200	40,400	60
April	11,300	760	980	21	344	313	187	13,900	54,300	52
May	11,000	945	2,020	91	411	319	219	15,000	69,400	72
June	7,750	927	1,430	9	343	289	254	11,000	80,400	43
July:										
Australia	1,480	100	--	18	--	--	--	1,600	9,130	--
Brazil	--	--	50	--	--	--	--	50	351	--
Canada	1,230	420	--	--	57	81	26	1,810	33,800	1
Colombia	--	--	133	--	--	--	--	133	640	--
Dominican Republic	--	--	847	--	4	--	--	851	5,920	--
Finland	351	36	--	--	--	--	28	415	1,900	--
France	161	--	--	--	27	--	14	202	1,300	11
Germany	--	9	--	--	34	1	25	70	415	23
Japan	(5/)	--	--	--	10	13	16	39	563	4
New Caledonia	--	--	340	--	--	--	--	340	2,940	--
Norway	1,940	--	--	--	--	--	--	1,940	14,700	--
Russia	1,760	101	52	--	15	--	--	1,920	12,700	--
South Africa	20	--	3	--	--	--	--	23	646	--
United Kingdom	146	9	--	(5/)	64	--	9	228	895	2
Zimbabwe	148	--	--	--	--	--	--	148	1,220	--
Other	--	7	43	--	26	179	98	354	3,330	(5/)
Total	7,230	684	1,470	18	238	274	216	10,100	90,500	42
1996: January-July	67,400	5,970	10,400	237	2,360	2,190	1,910	90,500	XX	375
1995: January-July	69,200	5,870	9,600	345	3,070	1,920	2,500	92,500	XX	2,090

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemical category includes chlorides (25%), sulfates (22%), and other salts (22%), supported catalysts (22%), and oxide, sesquioxide and hydroxide (65%).

3/ Excludes wrought nickel.

4/ May include revisions for prior months.

5/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 5
U.S. EXPORTS OF NICKEL, BY COUNTRY 1/

(Metric tons, nickel content 2/)

Period and country of destination	Cathodes, pellets, and briquets	Powder and flakes	Ferro- nickel	Metal- lurgical- grade oxide	Waste and scrap	Stainless steel scrap	Chemicals	Total 3/	Total year to date 4/	Wrought nickel
1995:										
July	135	138	98	260	893	1,660	160	3,330	28,600	21
August	226	118	76	340	1,540	3,400	186	5,890	34,500	42
September	46	69	77	240	1,090	2,240	185	3,950	38,500	39
October	44	239	3	297	1,830	2,410	289	5,110	43,600	51
November	38	72	235	196	1,270	2,370	117	4,300	47,900	18
December	21	74	294	471	827	1,800	164	3,650	51,500	147
January-December	1,310	1,230	807	3,500	14,200	27,600	2,920	51,500	XX	475
1996:										
January	7	69	429	262	714	1,570	158	3,210	3,210	22
February	72	53	60	78	903	1,430	305	2,900	6,110	23
March	80	92	181	271	859	1,140	261	2,880	8,990	52
April	149	63	119	134	965	2,760	389	4,570	13,600	27
May	82	171	220	331	782	1,520	519	3,620	17,200	31
June	79	142	73	616	800	1,530	295	3,530	20,700	19
July:										
Australia	--	(5/)	--	--	19	(5/)	--	19	62	1
Belgium	--	3	--	--	--	157	1	161	208	--
Canada	--	24	--	478	486	204	50	1,240	9,250	1
Germany	1	(5/)	--	--	82	(5/)	--	83	444	(5/)
India	--	--	350	--	--	4	(5/)	355	928	--
Italy	--	(5/)	--	--	--	(5/)	--	(5/)	14	--
Japan	--	7	--	--	98	124	148	377	2,300	2
Korea, Republic of	--	4	--	--	--	375	9	388	2,620	(5/)
Mexico	6	2	--	--	3	8	15	35	251	19
Netherlands	(5/)	2	--	--	18	3	--	23	186	(5/)
Spain	(5/)	--	--	--	--	472	--	472	2,860	--
Sweden	--	1	--	--	27	--	--	28	1,340	--
Taiwan	--	--	299	--	--	1,190	6	1,500	3,030	--
United Kingdom	--	1	--	--	22	7	19	49	234	4
Other	--	6	--	3	23	107	116	254	1,970	2
Total	7	50	650	480	778	2,650	364	4,980	25,700	30
1996: January-July	476	641	1,730	2,170	5,800	12,600	2,290	25,700	XX	205
1995: January-July	933	654	122	1,960	7,600	15,400	1,980	28,600	XX	178

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemical category includes chlorides (25%), sulfates (22%), and other salts (22%), supported catalysts (22%), and oxide, sesquioxide and hydroxide (65%).

3/ Excludes wrought nickel.

4/ May include revisions for prior months.

5/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF NICKEL ALLOYS, BY COUNTRY 1/

(Metric tons, gross weight)

Period and country of origin	Unwrought alloyed ingot	Bars, rods, and profiles	Wire	Plates and sheets	Foil	Tubes and pipes	Other alloyed articles	Total	Total year to date 2/
1995:									
July	297	121	170	155	(3/)	141	40	925	5,750
August	288	158	127	175	(3/)	162	34	945	6,700
September	113	66	109	90	(3/)	86	23	488	7,190
October	340	46	89	107	(3/)	93	44	717	7,900
November	179	61	169	112	(3/)	39	43	603	8,510
December	79	183	158	130	3	49	29	632	9,140
January-December	3,000	1,180	2,030	1,510	3	1,040	378	9,140	XX
1996:									
January	114	212	154	116	(3/)	98	43	738	738
February	259	152	75	92	(3/)	65	61	704	1,440
March	300	176	151	123	(3/)	107	58	916	2,360
April	561	180	158	132	(3/)	95	20	1,150	3,500
May	178	249	175	170	(3/)	67	18	858	4,360
June	221	242	116	157	(3/)	71	54	861	5,220
July:									
Australia	99	--	--	--	--	--	--	99	684
Belgium	16	--	--	--	--	--	(3/)	16	99
Brazil	--	--	--	--	--	--	--	--	10
Canada	1	2	9	(3/)	--	10	1	23	206
France	5	--	127	14	--	1	(3/)	147	839
Germany	1	69	28	76	(3/)	1	1	176	1,600
Italy	--	36	(3/)	--	--	2	2	40	423
Japan	11	--	1	(3/)	--	24	(3/)	37	186
Mexico	(3/)	--	--	--	--	--	(3/)	(3/)	57
Netherlands	--	--	--	(3/)	--	2	13	15	73
South Africa	16	--	--	--	--	--	--	16	568
Sweden	--	--	28	--	--	2	--	30	357
United Kingdom	39	11	(3/)	--	--	1	17	68	555
Other	--	--	(3/)	--	--	(3/)	73	73	313
Total	188	117	195	90	(3/)	44	107	743	5,960
1996: January-July	1,820	1,330	1,020	881	1	547	360	5,960	XX
1995: January-July	2,000	669	1,370	894	(3/)	613	205	5,750	XX

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ May include revisions for prior months.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 7
U.S. EXPORTS OF NICKEL ALLOYS, BY COUNTRY 1/

(Metric tons, gross weight)

Period and country of destination	Unwrought alloyed ingot	Bars, rods, and profiles	Wire	Plates and sheets	Foil	Tubes and pipes	Other alloyed articles	Total 2/	Total year to date 2/
1995:									
July	282	277	144	470	16	118	167	1,470	10,600
August	276	162	104	765	11	110	169	1,600	12,200
September	202	169	173	435	20	98	135	1,230	13,400
October	295	251	105	456	17	65	248	1,440	14,900
November	325	244	124	696	8	63	472	1,930	16,700
December	456	390	173	754	8	117	146	2,040	18,900
January-December	4,170	3,410	1,510	6,230	153	1,240	2,150	18,900	XX
1996:									
January	447	268	59	685	6	118	391	1,970	1,970
February	529	330	70	613	15	205	291	2,050	4,030
March	331	308	121	631	20	100	170	1,680	5,710
April	651	337	138	441	43	149	648	2,410	8,120
May	508	219	149	792	7	89	242	2,010	10,100
June	531	270	155	676	60	81	168	1,940	12,100
July:									
Australia	1	(3/)	2	140	--	--	25	168	804
Belgium	11	--	--	1	--	(3/)	--	12	173
Canada	57	41	26	38	5	34	23	225	2,470
France	56	5	--	9	(3/)	(3/)	7	78	1,610
Germany	(3/)	10	1	26	(3/)	10	(3/)	47	431
India	--	1	(3/)	(3/)	--	--	(3/)	1	61
Ireland	--	--	42	2	--	--	(3/)	44	130
Italy	--	20	3	63	--	1	1	88	725
Japan	155	21	21	148	(3/)	3	14	363	1,780
Korea, Republic of	--	(3/)	1	19	(3/)	(3/)	22	42	200
Mexico	(3/)	1	39	5	1	6	207	258	888
Netherlands	3	26	--	1	--	(3/)	(3/)	31	227
Singapore	--	3	2	1	--	(3/)	4	9	102
Spain	2	(3/)	--	7	--	1	--	10	117
Sweden	--	2	--	3	(3/)	(3/)	(3/)	5	90
Switzerland	3	--	(3/)	(3/)	--	(3/)	2	5	142
Taiwan	1	--	3	--	--	(3/)	8	11	88
United Kingdom	20	123	2	154	(3/)	6	5	310	2,120
Other	25	94	7	11	2	22	134	296	1,910
Total	335	349	148	628	8	84	451	2,000	14,100
1996: January-July	3,330	2,080	841	4,470	160	826	2,360	14,100	XX
1995: January-July	2,610	2,190	830	3,120	88	791	978	10,600	XX

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ May include revisions for prior months.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 8
NICKEL CONSUMPTION IN CAST AND WROUGHT PRODUCTS

	Percent	
	Wrought	Cast
August 1996:		
Stainless and heat resisting steels	100	(1/)
Alloy steels	99	1
Superalloys	80	20
Copper-nickel alloys	99	1
Other nickel-base alloys	100	(1/)

1/ Less than 1/2 unit.

TABLE 9
NICKEL PRICES

Date	Cathode NY Dealer \$/lb.	LME Cash \$/t	LME Cash \$/lb.	18/8 Stainless steel scrap Pittsburgh \$/long ton(gw)
Average for month of:				
1996:				
July	3.336	7,203.652	3.268	812
August	3.304	7,054.357	3.200	762
For week ending:				
1996:				
July 5	3.57-3.59	7,606.000	3.450	800-825
July 12	3.38-3.55	7,363.400	3.340	800-825
July 19	3.26-3.38	7,069.200	3.207	800-825
July 26	3.24-3.28	6,977.000	3.165	800-825
August 2	3.22-3.30	6,894.000	3.127	750-775
August 9	3.24-3.38	7,136.000	3.237	750-775
August 16	3.28-3.35	6,992.800	3.172	750-775
August 23	3.32-3.43	7,103.000	3.222	750-775
August 30	3.41-3.44	7,281.250	3.303	750-775
September 6	3.42-3.48	7,373.200	3.344	740-765
September 13	3.41-3.50	7,492.300	3.398	750-775
September 20	3.40-3.45	7,300.500	3.311	750-775

Sources: Platt's Metals Week and American Metal Market.